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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/091,818  | 03/06/2002  | James A. Frazier JR. | 50847.00114         | 9406             |
| 7590  | 12/02/2005  |                      | EXAMINER            |                  |
| SQUIRE, SANDERS & DEMPSEY L.L.P.<br>40 North Central Avenue, Suite 2700<br>Two Renaissance Square<br>Phoenix, AZ 85004-4424 |             |                      | ISSING, GREGORY C   |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 3662                |                  |

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |
|------------------------------|------------------------|---------------------|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|                              | 10/091,818             | FRAZIER ET AL.      |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |
|                              | Gregory C. Issing      | 3662                |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 29 August 2005.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 53-67 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 53-67 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20050629.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_ .  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_ .

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1. Note: Claims in the most recent amendment are improperly listed as "previously presented" when in fact they are newly entered in view of the new claim numbers, even though they were previously a part of the parent application.
2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 53-67 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Note: claim 53 sets forth a data link transponder for generating broadcast data, the broadcast data comprising aircraft position. This language appears to be misdescriptive since the transponder appears should be receiving broadcast data wherein the broadcast data is indicative of other aircraft position data. For purposes of this response, it is assumed that the transponder is receiving broadcast data as opposed to generating such since the remainder of the claim would be insufficiently enabled with respect to generating and transmitting steering commands to the other aircraft absent some knowledge of the other aircraft position.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 53, 57-59, and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Young et al (6,072,433).

The rejection is substantially set forth in the previous Office Action. In summary, Young et al disclose a transceiver attached to each aircraft in a formation (4:55-61) for communicating with each other aircraft and an AFF controller to receive reporting data from each of the aircraft, determine the instantaneous configuration, compare to the measured configuration to a desired configuration, and generating instructions/commands to instruct one or more formation members to adjust their relative position or attitude (5:33-50, 43-53 and 13:18-23). Thus, the AFF controller sends the commands and the other vehicles receive the commands and execute the commanded maneuver (13:24-25). The transceiver meets the scope of the data link transponder as well as

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the source of the communication link for transmitting steering commands. The AFF controller meets the scope of the TCAS computer and mission computer since it determines the relative positions of each formation member as well as generates steering commands for the other formation members. The other formation members receive the steering commands and execute such so as to remain in the desired configuration. GPS data can be used to determine the absolute position and velocity (12:1-8, 13:1-3). The applications of the AFF controller include aircraft collision avoidance and formation flying (14:25-40).

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

6. Claims 54-56, 60, 61, and 63-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al in view of either one of Boisvert et al (*ADS-Mode S System Overview*) or Drouilhet, Jr. et al (5,570,095).
7. Young et al teach the subject matter substantially as claimed as set forth above but fail to show each of the limitations of the dependent claims.
8. Firstly, Young et al disclose communication using electromagnetic signals; in view of the conventionality of UHF and VHF for communication of telemetry data in the art of radio communication and collision avoidance, and the fact that UHF/VHF are within the electromagnetic spectrum, the use of VHF and UHF frequencies for the communication link would have been obvious to the skilled artisan.

Boisvert et al and Drouilhet, Jr. et al each teach the conventionality of broadcasting GPS position information in conventional communication links associated with aircraft communications including an ADS-Mode S squitter and extended squitter message that incorporates position information as well as heading, movement and identification information (see Figure 1 of Boisvert et al and Figure 5 of Drouilhet, Jr. et al) wherein the identification information is beneficial to TCAS and cockpit display of traffic.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Young et al by utilizing known broadcast links to provide positional

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information for collision avoidance and traffic control in the form of ADS-broadcast, Mode S squitter and extended Mode S squitter data in view of the teachings of either one of Boisvert et al or Drouilhet, Jr. et al. Each of Boisvert et al or Drouilhet, Jr. et al teach the claimed broadcast link as well as the use of the broadcasted information for collision avoidance and cockpit display. Additionally, the telemetry of controller commands from the central controlling vehicle to each of the other aircraft via the use of the UHF/VHF band would have been obvious to the skilled artisan in view of the conventionality of such in the art. Each of Boisvert et al or Drouilhet, Jr. et al also teach the conventionality of the use of a cockpit display which would be obvious in flying formation control and collision avoidance.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

9. Claims 53-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fraughton et al in view of Constant and either one of Boisvert or Drouilhet, Jr. et al.

Fraughton et al disclose a direct, pilot-based system of traffic control and communication that does not require radar or interfere with existing TCAS yet provides inter-aircraft safety. The system operates without interrogation requirements to provide collision avoidance, navigation and emergency location functions. Figures 1A and 1B show the steps involved including transmitting own position, passively receiving other aircraft positions and displaying the positions of other aircraft relative to own (col. 11, lines 42-52). Fraughton et al suggest various position determining means, most particularly, GPS. When collision is possible, the secondary aircraft will receive a collision alert from the primary aircraft (col. 12, lines 3-11). Thus, Fraughton et al teach a system for avoiding collisions of aircraft including datalink transceivers for passively receiving broadcast data from other aircraft indicative of at least position, a navigation receiver for determining own aircraft position, processing means for determining the relative location of the other aircraft with respect to own, detecting possible collision, and generating an alert message in response to detection of possible collision.

Fraughton et al differ from the claimed subject matter since the response to detection of collision is the generation of a warning message and not a steering command that is generated and transmitted to the other aircraft in a formation. Additionally, the use of a channel of ADS-B, extended squitter, or Mode S data link is not specified as the communication channel over which the position information is communicated.

Constant teaches a system for aiding formation movement, particularly the flight of aircraft, wherein within each formation the relative positioning of the aircraft are controlled to avoid collisions. Position information is exchanged between a leader and follower, and the leader uses the analyzed relative positions in calculating commands to the apparatus of each follower including a command position (angle and distance from the leader), a commanded heading, a commanded speed, and a commanded altitude. The use of the commands, in a unified approach, is governed by predetermined rules of pilotability so that predetermined margins of safety are maintained and so that the danger of collisions is reduced. Each of Boisvert and Drouilhet, Jr et al teach the use of the various forms of transmissions known in the industry for broadcasting GPS position information including ADS-B, extended squitter and Mode S transponder.

It would have been obvious to one having ordinary skill in the art to modify Fraughton et al by incorporating the teachings of Constant whereby the relative position information used for collision avoidance is utilized in a fashion so as to provide a unified set of commands to certain aircraft when flying in a formation to reduce the danger of collisions, which is a specific environment meeting the scope of Fraughton et al, i.e. monitoring a fleet of aircraft within a predetermined range of one another for collision avoidance. Constant teaches the conventionality of formation flying. The dictated commands of Constant meet the scope of the claimed steering commands.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fraughton et al in view of Constant by using well-known existing communication channels to broadcast the GPS navigation information of Fraughton et al including ADS-B, extended squitter and Mode S transponder in view of the teachings of either

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one of Boisvert and Drouilhet, Jr et al to avoid duplication of transmitters in the aircraft and thus minimize cost and space.

10. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

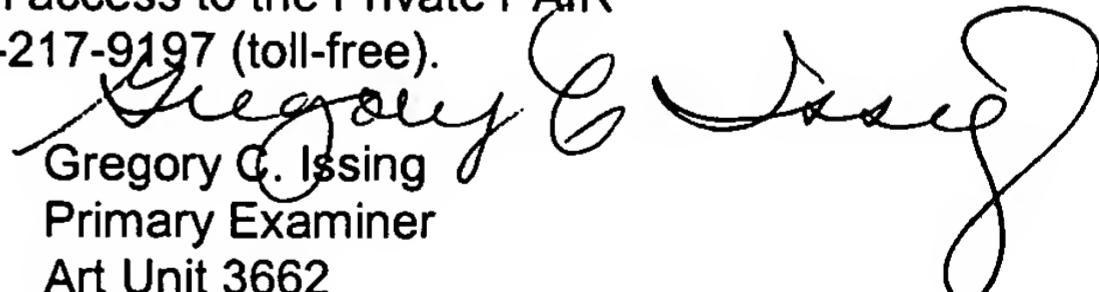
11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory C. Issing whose telephone number is (571)-272-6973. The examiner can normally be reached on Monday - Thursday 6:00 AM- 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571)-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Gregory C. Issing  
Primary Examiner  
Art Unit 3662

gci